



Analysis of the Usage of Information Communication Technologies (ICT) in Accessing Agricultural Information by Smallholder Farmers in Kwara State, Nigeria

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ABSTRACT: Owing to the importance of information communication technologies on activities of rural households, this study analyzed the usage of ICTs in dissemination of agricultural information to smallholder farmers in Kwara state, Nigeria. A structured questionnaire was used to elicit information from 210 smallholder farmers which were selected using both random and systematic sampling techniques. Descriptive statistics and chi square were used to analyze data. The results reveal that the mean age of the farmers was 37.6 years, while 52.9% of the farmers were females. The three most important ICT tools used by farmers were mobile phone, radio and television. There was relevance and timeliness in the quality of information through radio and mobile phone, respectively based on farmers' perception. However, the major constraints identified by farmers were erratic power supply, high call rates and bad networks. There was significant relationship between respondents' age ($\chi^2=17.333$, $p= 0.010$), gender ($\chi^2=32.267$, $p= 0.000$), education ($\chi^2=122.000$, $p= 0.000$), marital status ($\chi^2=18.467$, $p= 0.048$) and the type of ICTs used in agricultural information dissemination. The study therefore concludes that ICTs is well used by the farmers. The study recommends amongst others the need for relevant stakeholders to set up an enabling environment that will enhance economic development.

Keywords: ICT, Perception, Timeliness, Mobile phone, Radio, Agricultural Information.

I. INTRODUCTION

In order to achieve effective agricultural transformation, farmers need tools and technologies that can help them address issues such as low productivity, weak market linkages, product movement, best management practices and price trends e.t.c. To help farmers increase their production and their livelihood, we need to take advantage of tools that can provide customized information and messages for farmers on what to do, how to do it and when to do it. This is the role Information Communication Technologies (ICTs) can play, helping provide farmers with timely information that is precise and locally relevant. Singh (2006) recognized the potential of ICTs to contribute to agriculture and rural development. ICTs refer to hardware, software, networks and media for collection, storage, processing, transmission and presentation of information in the format of voice, data, text and images (World Bank, 2002). However, ICTs include computers, internet, geographical information systems, mobile phones and traditional media (radio, television) which are used in delivering agricultural information to the farmers (Stienen et al., 2007).

The desire to promote better information access to improve the socio-economic condition of the farmers has always been the top priority of agricultural extensionists and rural advisory service providers. According to FAO (2011), exchanging information is critical for the stakeholders in agriculture value chain in order to reduce the asymmetries in information and communication as well as to reduce the vicious circle of poverty. Furthermore, the role of ICTs in accessing more information in order to enhance food security and support rural livelihoods has also been increasingly recognized and officially endorsed at the World Summit on the Information Society (IICD, 2007).

In different parts of the world, ICTs are seen to have positively contributed towards rural development. Stienen et al., (2007) pointed out that extension workers use ICTs to gather, retrieve, adapt, localize and disseminate a broad range of information needed by rural families. A study conducted by Fu and Acter (2010) in India found that the amount, speed and quality of the extension services delivery have been improved significantly through the use of mobile phone technology. Also Singh (2006) indicated radio and TV programs to have helped the farmers in South Korea to receive support for improved crop production, quality control methods, processing, packaging and marketing. Farmers in Kenya are adopting a new mobile application (LandInfo) that enables them to understand the suitability of their soil for various crops, which minimizes heavy annual losses associated with inadequate knowledge of soil composition. This shows that ICTs have helped to fill the gap that exists in extension service provision. Therefore effective use of ICTs in agricultural extension system can lead to the improved agricultural productivity and perhaps realization of the Sustainable Development Goals (SDG).

For many years in Nigeria, farmers have been accessing agricultural information from extension workers through interpersonal communications. In the current situation, this seems to be inefficient given that the ratio of extension staff to farmers is increasing. Factors such as poor infrastructures have also contributed to this inefficiency. For example most of the roads in rural areas are not passable during wet season; and this prohibits communication between farmers and the extension staff. According to United Nations (UN, 2005), access to information and knowledge for farmers in remote villages is restricted due to the lack of infrastructure. This situation calls for an alternative approaches for agricultural information dissemination such as use of ICTs.

Since relevant and timely information is critical in agriculture, ICTs are seen as a partial solution to rapidly get information to the increasing number of farming families. Use of ICTs has the potential to enable farmers obtain up-to-date knowledge and information about agricultural technologies, best practices, markets, price trends, consumer preferences, weather, and soil-moisture conditions. With regard to agriculture and rural development occupying an important place in Nigeria's economy, the research has attempted to study the level of usage of ICTs and also the problems faced by the farmers in the usage of ICTs. In fact, there is a need to realize that in order to reach the farming and rural development community in an efficient manner, it is important to study the type of communication media used by farmers, their frequency of usage as well as the degree of usefulness of various ICTs as knowledge of the use of different ICTs will be helpful in drawing a suitable extension strategy as well as to provide improved ICT extension services to uplift the socio-economic status of the farmers and the rural people. It is in this context that the objectives of the study were designed as follows:

1. To measure the frequency of usage of ICTs among farmers.
2. To examine farmers' perception of the timeliness and relevance of agricultural information through the use of ICTs.
3. To identify the constraints to the use of ICTs among the farmers.

II. HYPOTHESIS

H₀: There is no significant difference between some selected socio-economic characteristics of the respondents and type of ICTs used among farmers.

III. METHODOLOGY

The study was conducted in Zone C of Kwara State agricultural zone which comprises of Ilorin West, Ilorin South, Ilorin East, Moro and Asa LGAs. Kwara is situated in North-central Nigeria. The primary ethnic group of the State is Yoruba, with significant Nupe, Baruba Hausa minorities. Kwara State lies on latitude 7° 15' N and longitude 6° 18' E and covers a land area of about 32500km². The State shares common boundaries with Oyo, Ondo, Osun, Niger and Kogi States and has an international border with the Republic of Benin (Kwara State Ministry of Information 2011). Kwara State has about 260,528 farm families (KSD, 2007) and about 36,820 hectares of farmland.

The study targeted smallholder farmers in Kwara State. A sample size of 210 smallholder farmers was involved in the study. This was determined using the formula proposed by Israel (2012).

$$N = Z^2 \times PQ / e^2$$

Where: n= required sample size,

Z = confidence level at 95% (standard value of 1.96),

p = is the estimated proportion of an attribute that is present in the population, (for this case p= 0.3 i.e. 30%).

e= margin of error at 5% (standard value of 0.05)

$$\text{i.e. } n = 1.962 \times 0.2 (1 - 0.3) / 0.052 = 210$$

Simple random technique was used to select zone C used in the study. In this technique a lottery method was used to select one (1) agricultural zone out of the four (4) agricultural zones in Kwara State. The technique was chosen because the subjects are selected objectively so that there will be no opportunity for human bias to manifest. The researchers used Stat Trek's Random Number Generator cards of random numbers to represent one zone among the 4 available zones in the state were then developed and mixed in a box from which one number was picked from the box.

Three communities (3) were randomly selected each from the five (5) local governments in the zone using similar method (lottery). In each community, the researchers obtained a list of farmers from the village agricultural extension officer. From the list, 14 of them were selected using systematic sampling technique to obtain 210 respondents.

Statistical tools such as: frequency, percentage, 5 point likert type of scale, chi-square. Statistical Package of Social Sciences (SPSS) and Microsoft Excel were used for data analysis.

IV. RESULTS AND DISCUSSION

Table 1 present the result of the socioeconomic characteristics of the respondents. It revealed that 39.5% of the respondents are below 45years. The result is in line with Okwu and loorka (2011) who found the age group between 21 to 40 years to be mostly engaged in agricultural activities. This indicate that majority of the farmers are still in their middle age and have required strength for farming activities in the study area. Typically, young people adopt innovations faster; as older farmers have a tendency to stick to their old production techniques and they are usually unwilling to accept change (Bolarinwa and Oyeyinka, 2011). Results further indicate that 47.1% of the respondents were males whereas the female respondents were 52.9%. This shows that both males and females are involved in farming. According to Scott et al. (2005), both males and females are equally participating in production because of the increase in responsibilities to both parties. The results also carry a sense of great gender equality in agricultural participation in the area. According to Food and Agricultural Organization, FAO (2010) rural women provide 50% of agricultural labour force.

Table 1 also revealed that the biggest proportion of the farmers (50.5%) had completed primary education while only 8.6% of the farmers had tertiary education. These results conform to the findings by Churiet al. (2012) and this implies that majority of farmers in rural areas have not gone for higher level education. Although, a study by Voh (2002) reported that there is a positive and significant relationship between formal education and adoption of technologies. Results also show that about 59.0% of the respondents are married, 25.3% are single whereas 5.7% and 10.0% are divorced and widowed respectively. This indicates that married people dominate the farming activities in the area than the other categories.

Frequency of usage of ICTs

Table 2 shows the result of the usage of the ICT tools by the respondent and this revealed that mobile phone was the most frequently used ICT tool among the farmers. This indicated that the increase in the usage of mobile phones is increasing at an alarming rate. This is due to the fact that mobile phones are now easily affordable and could be used by farmers who are non-literate. The usage trend in mobile phones also indicated that it can offer huge scope in the future if appropriately used for the purpose of agriculture and other rural development purposes. Next to mobile phones is radio which was used very frequently by the farmers. It was also reported that the use of television is lower as compared to mobile phones and radio. Internet and its applications are still being used rarely by few of the respondents who are young and educated.

Farmers' perception of the effectiveness of ICTs in disseminating agricultural information

Figure 1 revealed the respondents opinion on the relevancy of the information as well as timeliness of the information they received through the use of ICTs mostly accessible to them. Timeliness of agricultural information is very crucial to farmers' success. Farmers need to be provided with the information at the right time so as to apply that information in their farming activities for better farm productivity. Farmers need timely information to be able to plan for activities to be done according to the situation encountered. This study measured the timeliness of the agricultural information provided to farmers based on the seasonal activities to which ICTs can be used as information tools required by the farmers. The respondents were asked to rate the information on the three grounds; being timely, average or late. Timely delivery of information meant that the farmer received information when they were able to make use of it. Average meant the farmers could only use part of it whereas late meant the information is outdated and the farmers were not able to use any of it. About 56.2% of the farmers indicated that mobile phone provides timely information whereas 48.5% and 40.2% indicated radio and television respectively to provide timely information.

From figure 1, it is clear that mobile phone is very timely in disseminating agricultural information as indicated by the majority (54%) of the respondents. The main reason is because the farmers find it easy to move with phones because they are light and thus can access the information at their time of convenience at home or on their farms. Mitta et al., 2010, argued out that timeliness is one of the important features that enable farmers to use mobile-enabled agricultural information effectively.

Information should not only offer the benefits of timeliness, but also be able to suit the relevant context. This study also addressed the relevance of information provided to farmers using ICT facilities by looking into the suitability of the information in the farmer's context. That is the information brought to the farmers should address the challenges of a particular farming system undertaken by the farmers at a particular area. About 49.4%, 47.4% and 29.6% of the farmers who are using radio, mobile phone and television respectively, indicated that the information sent to them is relevant to their farming requirements (see figure 1). The radio results collected in this research were similar to that found out by Dodds (1999) who claimed that the information listened from the radio programs is very suitable in helping farmers to increase their crop yields.

Constraints in the use of ICTs

Table 3 revealed the constraints to the utilization of Information Communication Technologies which was analyzed using a 5 point Likert type of scale and the mean score was used to rank the various constraints. Top on the list of constraints was erratic power supply with a mean score of 4.35, expensive call rate (4.10) and bad network (3.92) ranked 2nd and 3rd respectively. This result agrees with the work of Arokoyo (2005) who also listed bad network as one of the key constraints to the use of ICT. Also, items such as High cost of repair of phones, low literacy level among farmers' and lack of awareness of mobile telephony ranked 10th, 11th, and 12th with mean scores 2.68, 1.80 and 1.49 respectively. The implication is that those items do not constitute major constraints to farmers' utilization of information and communication technology.

Test of Hypothesis

Ho₁: There is no significant difference between some selected socio-economic characteristics of the respondents and the type of ICTs used among farmers.

Table 4 present the result of the hypothesis tested. From table 4, variables of age, gender, marital status and education all had a significant association with the usage of ICTs of the farmers. With regard to usage of ICTs, it was found out that old aged farmers had lesser degree of usage of ICTs when compared to young farmers with preferably higher level of educational qualification. Therefore, the null hypothesis is hereby rejected. The result of the table shows that the socio economic characteristics of the respondent have positive influence on the usage of ICTs among farmers. The result agrees with Galloway and Mochrie (2005) who found that education was an important aspect in adoption and the use of ICTs.

V. CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study, it can be concluded that ICTs has to an extent been well utilized by the farmers. Erratic power supply, high call tariff and bad networks are one of the major constraints limiting farmers from fully exploring the potentials of the technology. In lieu of these, the following recommendations were made: Network providers should improve their services especially in rural areas so as to enable the farmers have value for their money by being able to tap into the potentials that ICTs avails them. For maximum use of ICTs, government should make policies that will favour both the network providers and the users (farmers). Heavy tax should not be inflicted upon the network providers as this go a long way in determining their tariff and subscription charges. Dissemination of agriculture-related information through F.M radio programmes would be recommended. Finally, the government this time must get it right in the area of providing uninterrupted electricity supply as this is the starting point for setting up a robust economy as no economy ever thrives until the issue of electricity is resolved.

VI. REFERENCES

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